Department of Navy

- Technology Transition -

March 2005

Office of Naval Research

Ms WindyJoy Springs

Rapid Technology Transition Program Director

Agenda

- Department of Navy - Vision
- Department of Navy – Organization
- Department of Navy – How to do business with
- Naval Needs
- Information Resources

Department of Navy – Vision
Sea Power 21

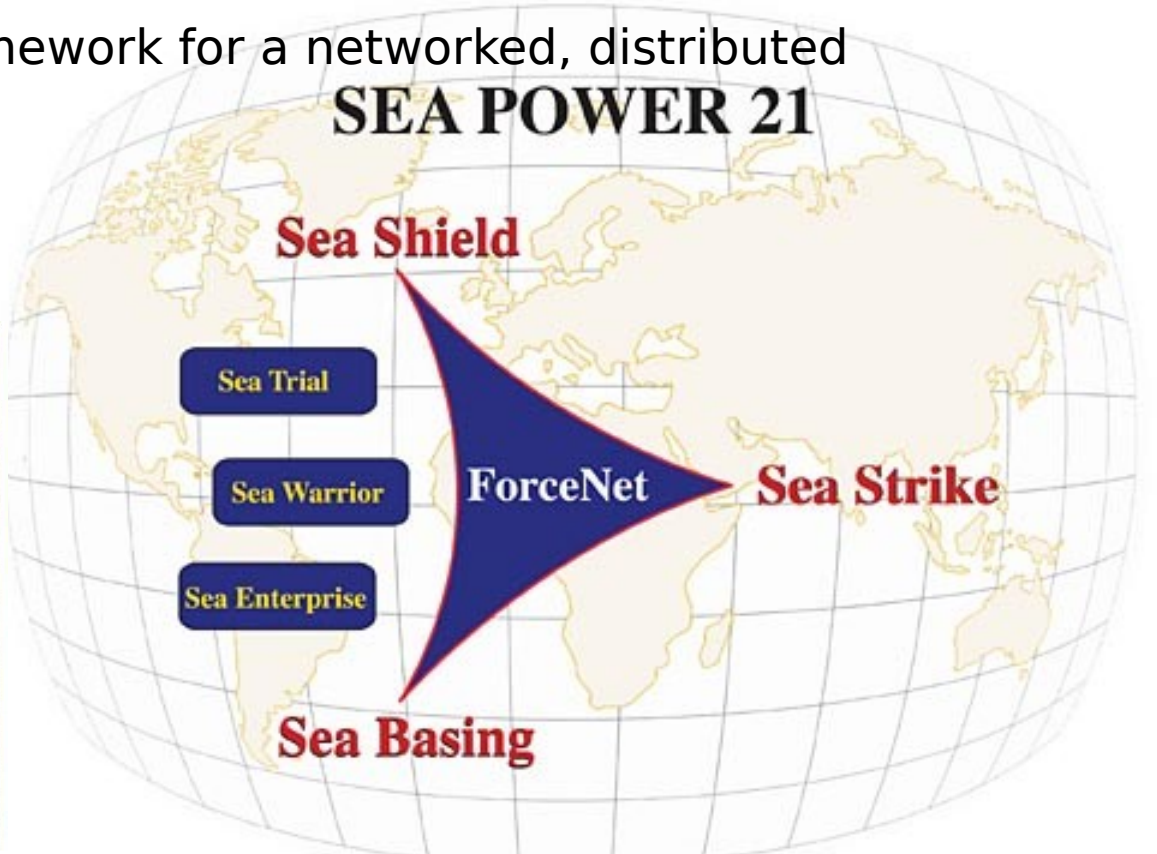
Navy

Sea Strike —Projecting Precise and Persistent Offensive Power

Sea Shield —Projecting Global Defensive Assurance

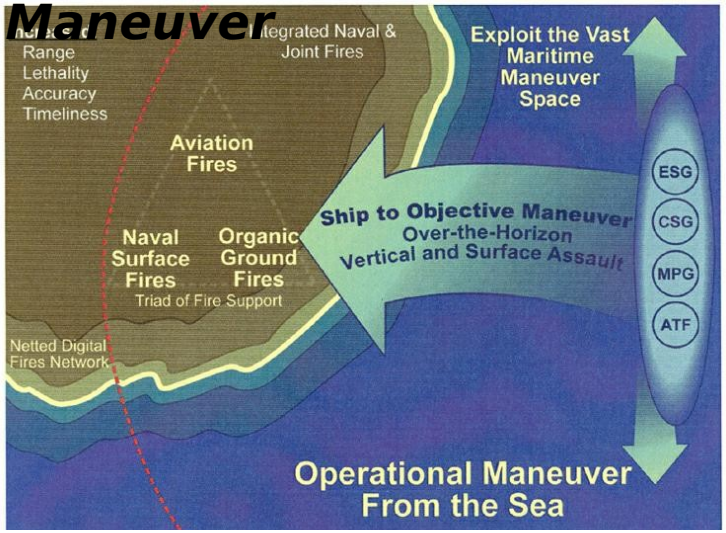
Sea Basing —Projecting Joint Operational Independence

FORCEnet — Integrating framework for a networked, distributed combat force



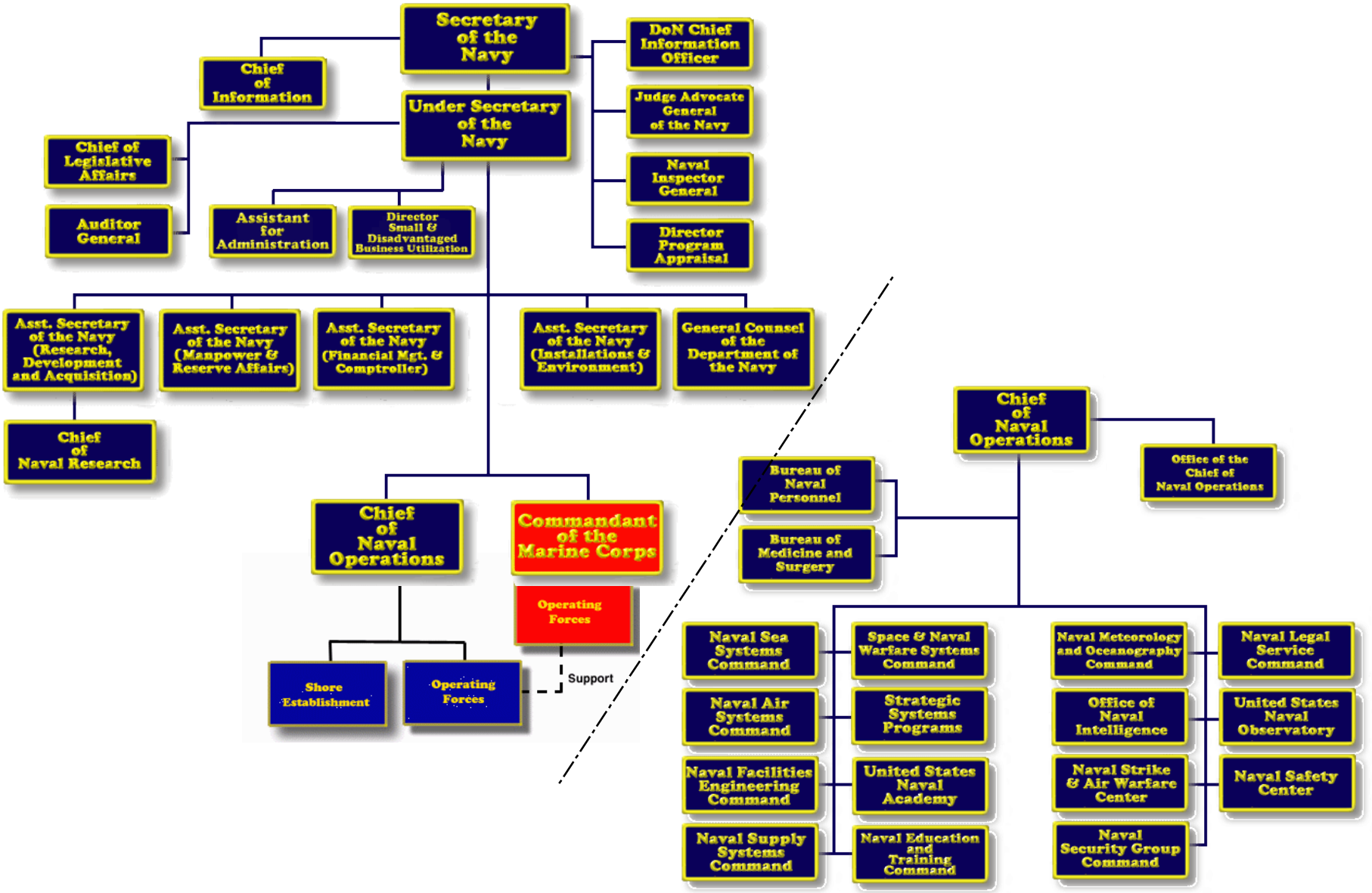
Marine Corps

-Ship to Objective Maneuver



http://www.chinfo.navy.mil/navpalib/cno/proceedings.html

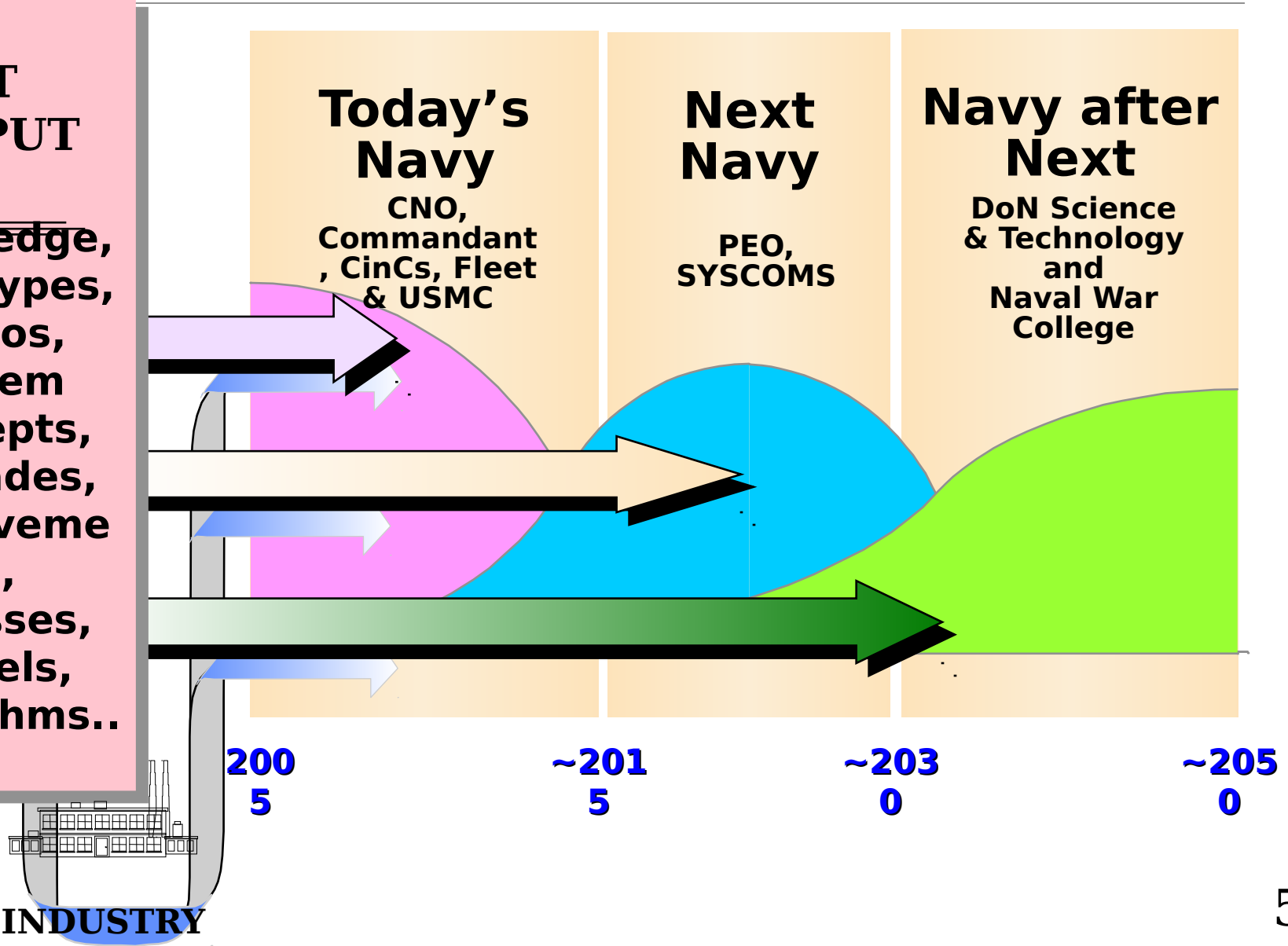
Department of Navy - Organization


Secretary of the Navy
Chief of Information
DoN Chief Information Officer
Under Secretary of the Navy
Judge Advocate General of the Navy
Chief of Legislative Affairs
Naval Inspector General
Auditor General
Assistant for Administration
Director Small & Disadvantaged Business Utilization
Director Program Appraisal
Asst. Secretary of the Navy (Research, Development and Acquisition)
Asst. Secretary of the Navy (Manpower & Reserve Affairs)
Asst. Secretary of the Navy (Financial Mgt. & Comptroller)
Asst. Secretary of the Navy (Installations & Environment)
General Counsel of the Department of the Navy
Chief of Naval Research
Chief of Naval Operations
Commandant of the Marine Corps
Operating Forces
Shore Establishment
Operating Forces
Support
Chief of Naval Operations
Office of the Chief of Naval Operations
Bureau of Naval Personnel
Bureau of Medicine and Surgery
Naval Sea Systems Command
Space & Naval Warfare Systems Command
Naval Meteorology and Oceanography Command
Naval Legal Service Command
Naval Air Systems Command
Strategic Systems Programs
Office of Naval Intelligence
United States Naval Observatory
Naval Facilities Engineering Command
United States Naval Academy
Naval Strike & Air Warfare Center
Naval Safety Center
Naval Supply Systems Command
Naval Education and Training Command
Naval Security Group Command

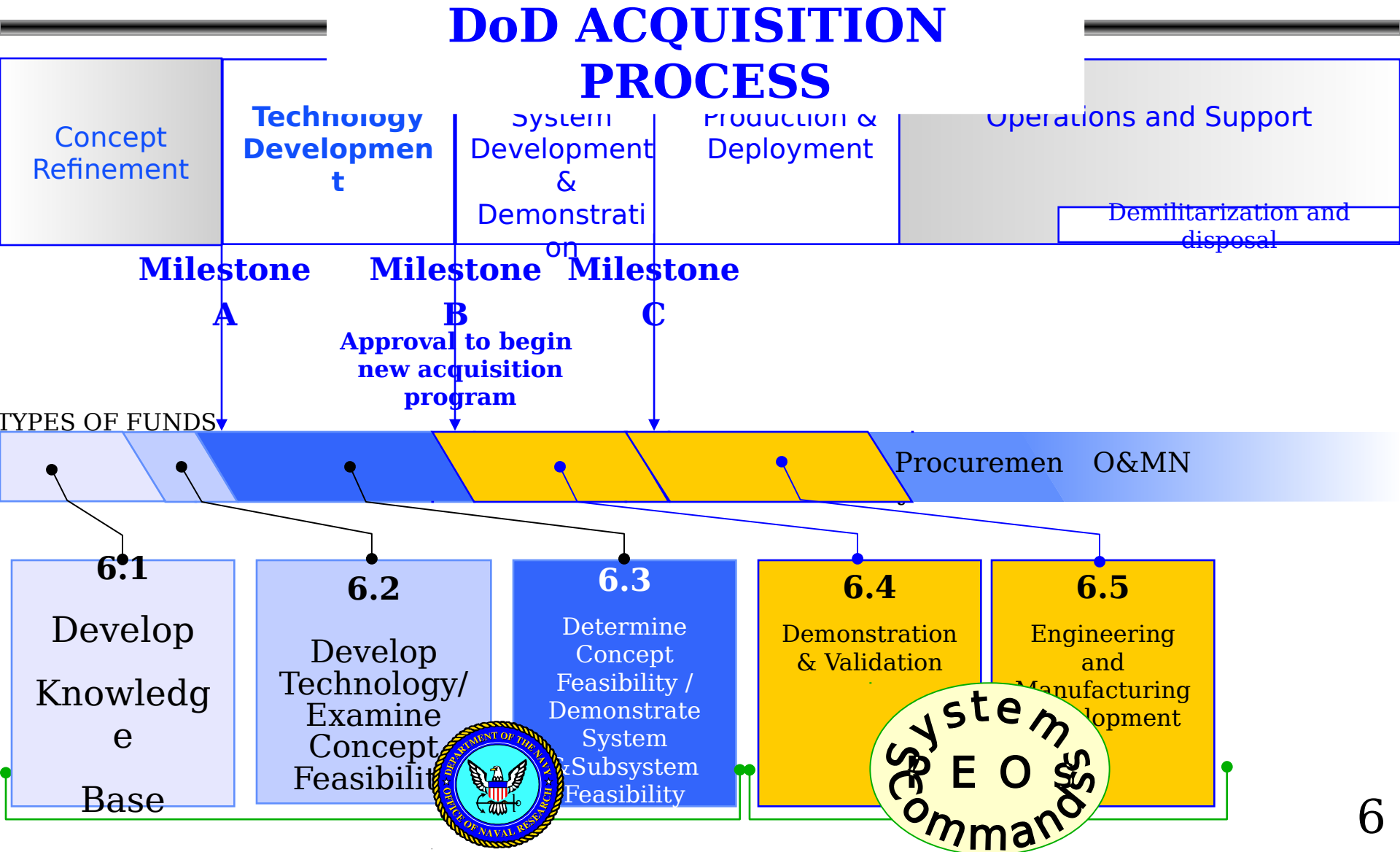
Developing Capabilities

S&T OUTPUT

- ~~knowledge~~,
- prototypes,
- demos,
- system
- concepts,
- upgrades,
- improvements,
- processes,
- models,
- algorithms...



Department of Defense – Process



Technology Readiness Levels (TRLs)

$	Roles	Steps to Transition	DoD 5000 Series Technology Readiness Level (TRL)
6.4 / 6.3 / 6.2 / 6.1	Technology Directorate / Acquisition Program Management	System Test,Launch and Operations	9. Actual system “flight proven” through successful mission operations (OT&E)
		System/Subsystem Development	8. Actual system completed and “flight qualified” through test and demonstration (ground/flight) (DT&E)
		Technology Demonstration	7. Systems prototype demonstration in a flight/space environment (System Prototype Test in Operational Environment) 6. System/subsystem model or prototype demonstration in a relevant environment (Prototype Test in Relevant Environment)
		Technology Development	**5. Component and/or breadboard validation in a relevant environment** (Breadboard Integration)
		Research to Prove Feasibility	**4. Component and/or breadboard validation in laboratory environment** (Breadboard Integration)
			3. Analytical and experiment critical function and/or characteristic proof of concept (Component Development)
		Basic Technology Research	**2. Technology concept and/or application formulated** (Invention) **1. Basic principle observed/reported** (Paper Study)

Department of Navy
-Typical Profile of R&D/Acquisition

Here is ONR

Secretary of the Navy

$115B

Assistant Secretary of the Navy

Research, Development and Acquisition

Research and Development

$14.1B

Acquisition

$29B

VCNO & ACMC

Office of Naval Research

$1.71B

Naval Research Lab

Basic Research

Applied Research

Advanced Tech. Development

Test & Evaluation

DEM/Val

EMD

Op. Systems Development

PEOs, Systems Commands, Warfare Centers

$12.4B

Warfare Centers

11 Program Executive Officers

2 Direct Reporting Program managers

6 Systems Commands

54 Major Program managers

467 Program managers

Aircraft carriers

Combat ships

Submarines

Aircraft

Weapons systems

Ammunition

Combat boots

Source: FY04 Blue Book, FY04 R-1

Department of Navy - Technology Transition

- **ONR coordinates, executes, and promotes the science and technology programs of the United States Navy and Marine Corps through schools, universities, government laboratories, and nonprofit and for-profit organizations**
- **ONR stimulates advantageous government-industry partnerships and promotes the development in manufacturing of innovative, cost-efficient, and cost-reducing processes**
- **Wide variety of programs for technology development and transition**

S&T Investment Profile

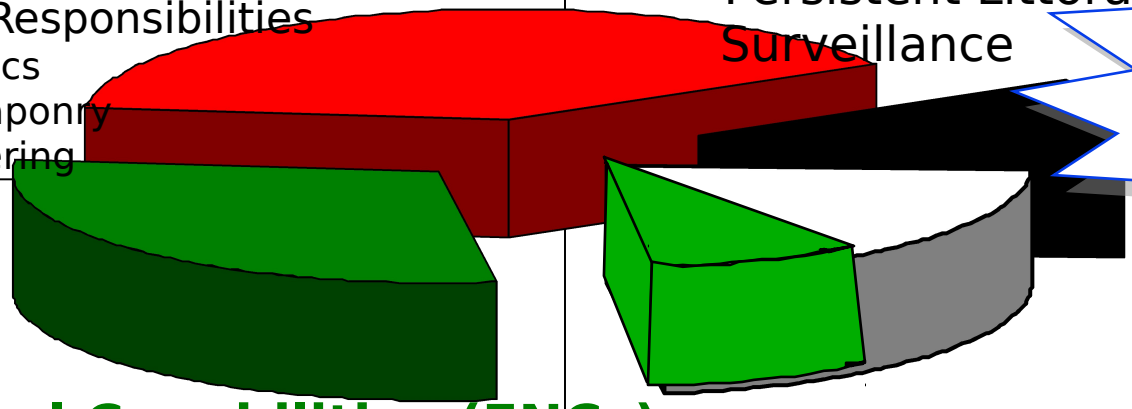
Discovery & Invention (D&I) [6.1, 6.2]

- Naval scientific disciplines
- NRL/Warfare Centers
- HM&E (facts of life)
- Technical workforce sustainment
- High impacts/surprises
- National Naval Responsibilities
  - Ocean Acoustics
  - Undersea Weaponry
  - Naval Engineering

Innovative Naval Prototypes (INPs)

- Electromagnetic Gun
- Sea Base Enablers
- Tactical Use of Space
- Persistent Littoral
  Surveillance

Game Changers



Future Naval Capabilities (FNCs) [6.3]

- Sea Strike
- Sea Base
- Sea Shied
- FORCEnet
- Enterprise and Platform Enablers

Quick Reaction and Other

Qui

- SwampWorks
- Tech Solutions
- MCWL

- Pass-Through - to JFCOM
- OSD Directed
- Infrastructure - Efforts enabling ONR's mission execution such as

Advanced Concept Technology Demonstration

- **A process that permits the *early* and *inexpensive evaluation* of mature advanced technology to meet the needs of and provide support to a military user, the warfighter.**
- **This Process determines military utility of new technology.**
- ***Develops and refines operational concepts* so as to take full advantage of new capability.**
- **Provides a product that must allow for transition into a formal acquisition effort and must support military capability.**
- **Must produce a product that provides for evaluation and refinement (a "residual").**
- **Sponsored and executed *jointly*.**
- **Funded primarily from service budgets.**
- **Technology can come from many sources**

Department of Navy – Request for Technology and Systems

- **Broad Area Announcements (BAAs)**
  - Competitive funding of meritorious research across a spectrum of science and engineering disciplines.
  - Prior to preparing proposals, potential offerors are strongly encouraged to contact the technical point of contact whose program best matches the offeror's field of interest.
- **Solicitations**
  - Competitive funding of the development of systems
  - See various DoD and Navy websites for solicitation
- **Procurement of Commercial Items and Services**
  - Competitive funding of services and products
  - www.**fedbiz**opps.gov

See www.dodtechmatch.com for wide variety of opportunities and resources

Department of Defense and Navy - Programs for Small

- **SBIR (Small Business Innovation Research) Program**

  Small Business set aside program designed to promote high technology development that will assist the Navy to meet its mission needs and the nation to develop new products for public use/consumption.

- **STTR (Small Business Technology Transfer) Program**

  Small Business set aside program, similar to the SBIR program, however, the small business is required to have an agreement with a research institution that has both entities developing the technology required by the Navy.

http://www.acq.osd.mil/sadbu/sbir/

ONR Programs - Partnerships

- **Navy Acquisition R&D Information Center (NARDIC)**
  - **“411” resource for military requirements, threat problems and planning between Navy & industry**
- **Naval-Industry R&D Partnership Conference**
  - **Focal point for NRE and industry to advance the Discovery to Deployment agenda**
- **Navy Potential Contractor Program (NPCP)**
  - **Expands base of potential contractors through controlled classified information access**
- **Domestic Technology Transfer Program**
  - **Strategic partnerships between Naval Research Enterprise and commercial sector through Cooperative Research and Development Agreements (CRADAs) and Patent Licensing Agreements (PLAs)**
- **Independent Research and Development Program (IR&D)**
  - **Effective communication of Navy needs to industry and Navy use of industry-developed R&D**

http://www.onr.navy.mil/sci_tech/industrial/362/

ONR Programs – Manufacturing Technology

- **Mission: The development of advanced manufacturing processes relevant to the development, production and lifecycle support of weapon systems, equipment and materials.**
  - **Risk Reduction**
  - **Enabling Technologies**
  - **Joint Service Coordination**
  - **Centers of Excellence (9 Centers)**
    - **Metals, Composites, Electronics, Electro-Optics, Best Practices, Shipbuilding, Joining, Lasers, Energetics**
  - **Investment Strategy**
    - **PEO (Carriers) – CVN-21**
    - **PEO (Ships) DDX**
    - **J-UCAS**

http://www.onr.navy.mil/sci_tech/industrial/361/

ONR Program - Commercial Technology Transition Officer

To *rapidly* transition technology from any source into the Fleet/Force

CTTO

Matchmake
Solutions to Naval Needs

Naval Acquisition Programs

PEOs

Deal
Transition Agreement

Funded by RTT* Program

CTTO is a Deal Broker

Getting Started…

Recommend determine and know the following up front:

- **What is the Naval Need the technology/product is solving**
- **What program(s) need the technology/product**
- **Who are the other government/industry partners in the solution**
- **When is the insertion window**
- **What policies and guidance may impact the use of the technology/product**
- **How much money is available for development, integration, and procurement**
- **How many are needed**

Quick Evaluation

Does the technology…

- **Change manpower requirements (#, skills)**
- **Require new/different data/information**
- **Change operations**
- **Require new logistics**
- **Impact planning**
- **Require changes to existing infrastructure**
- **Impact training requirements**
- **Require more/less funding to buy & operate**
- **Impact health and safety**
- **Require any legal, policy or guidance changes**

….Be Aware

- **Much DoD business is done by Prime Contractors**
- **The government generally has data rights, IP etc if government funding is used to develop the product**
  - **Be familiar with the Federal Acquisition Regulation/Defense Federal Acquisition Regulation**
  - **IP can be a negotiation point -> SBIR protects IP for a certain number of years**
- **Government contracting is a deliberate process and is time consuming**
- **Execution of Naval programs is deliberate**
  - **Oversight**
  - **Demonstrations conducted during windows of opportunity**
  - **Land-based testing**
  - **Sea-based testing (6 month deployment)**
  - **Joint Service/Navy certifications/qualification processes**

Naval Needs

- **Naval Needs are a desired increase in capability**
- **The acquisition and S&T communities work closely together to identify technology approaches and solutions**
- **Each domain has an organization that works to identify the technologies desired and to either find a commercial solution or have a solution developed**
  - **These organizations are referred to as the 'X-TECHs'**
    - **Aircraft – 'AIRTECH'**
    - **Ships – SURFTECH**
    - **Carriers - CARTECH**
    - **Submarines – SUBTECH**
    - **FORCEnet – 'I-TECH'**
- **Watch for desired capabilities in the following:**
  - **Broad Area Announcements, Solicitations, FedBizOPs**
  - **"X-TECHs" websites, Conferences, …**

X-TECHs

ONR/Gov/Industry

'X-TECHs'

Facilitate Technology Transition

Naval Systems Acquisition

Naval Aviation System Command

- PEO Tactical Air Programs
- PEO Strike Weapons and Unmanned Aviation
- PEO Air ASW, Assault & Special Missions

→ **'AIR TECH'** (Adv Technology Review Board)

Naval Sea System Command

- PEO Aircraft Carriers → **CARTECH**
- PEO Integrated Warfare
- PEO Ships
- PEO Littoral and Mine Warfare → **SURFTECH**
- PEO Submarines → **SUBTECH**

Space and Naval Warfare Systems Command

- PEO C4I and Space
- PEO Information Technology

→ **'I – TECH'** (In formulation)

Naval Needs – 'AIR TECH'

NAVAIR's Advanced Technology Review Board

Selected needs from http://atrb.navair.navy.mil

- **>See 'roadmap' link under each ATRB to see complete list of needs**

- **Data fusion/information processing**
- **Ocean sensors**
- **Automated mission planning**
- **Displays**
- **High speed/high density over the horizon communications**
- **Corrosion prevention and corrosion treatment**
- **Obstacle and wire strike detection and avoidance**
- **Voice recognition & voice synthesis/speech to text**
- **Decision aids to reduce operator burden/collaborative tools**
- **High density energy sources**
- **Chem/Bio detection and decontamination**

AIRTECH

Dave Bailey (301) 342-0219 , david.b.bailey@navy.mil

Naval Needs – SURFTECH

- Autonomous Vehicles
- Long / Ultra-Long Endurance Survivable Intelligence Surveillance Reconnaissance and Targeting Assets
- Battle Damage Assessment
- Information Assurance / Fault Tolerant Processing & Networks
- Surface Combatant Damage Tolerance and Damage Control
- Modular Sea Power Systems
- Over the Horizon / Beyond Line of Sight Voice & Data Comms Multi-Path Redundancy
- Biological Threat & CBRN Detection / Decontamination
- In-Port Air Defense Radar
- Cohesive, Coherent Digital Radar Development / Overland Radar
- Ship Robotic Interfaces
- ...See www.dodtechmatch.com for full list

SURFTECH

Betsy DeLong (202) 781-4818, DeLongBB@navsea.navy.mil

Naval Needs – CARTECH

Enhanced Weapons / Material Movement

- Automated Material Movement:

- High rate vertical/horizontal movement

- Compact Agile Mover (human amplification)

- Automated Warehousing

- Automatic Aircraft Tracking

- RFID tags – Safe to ordnance & electronics

Design Enhancements

•Consolidated Energy Storage and Power Conversion

•Fuel Handling Automation

•High Power Electronics

•Advanced Cooling

•Hydraulic/ Electric Actuators

•Condition Based Maintenance

•Non-Invasive Inspections

-Sensors to assess coating wear

•Advanced Noise Reduction/Control

Warfare Systems

•Reduced number of topside antennas

•Carrier Strike Planning and decision aids

Advanced Materials

•Lightweight Materials (Metal/Composites)

•Passive Jet Blast Deflector Materials

•Improved Surface Coatings and preservation techniques

•High Durability Non-skid

Advanced Ship Self Defense

•Torpedo Defense

•Advanced Point Defense Weapons

•Advanced Force Protection Measures

•Directed Energy

Ship's Force Service Improvements

•Training and Mission Rehearsal / Reconstruction

•Habitability/ Comms to home/ Quality of service

•Safety/Medical/Wound & Injury rehab

PEO Aircraft Carriers
Gary Smith (703) 578-5665, gmith@spa.c
CARTECH@spa.com

Naval Needs – SUBTECH

- **Renewable energy sources for all sizes of Unmanned Underwater Vechiles**
- **Advanced motor control and device technologies (lightweight high efficiency)**
- **Offboard sensors and sensor integration**
- **Multi Level Security/Multiple Independent Levels of Security**
- **Improved Computer Aided Detection/Computer Aided Classification (recognition)**
- **High Power Transmission through pressurized boundary**
- **AC Link Converter (lightweight)**

FY05 Themes

- **Extend analysis and display software to surface and air platforms**
  - **Reduction in training infrastructure**
  - **Reduction in software support**
- **Improve Ship Construction by expanding open architectures and software reuse**
- **Record and exploit element level data from Mid Frequency sonars**

Naval Needs – 'I TECH'

- **Common, Persistent Maritime picture - improving shared situational awareness across the force**
- **Computer Network Defense and Information Assurance - assured info**
- **Ubiquitous communications and network infrastructure - bandwidth management, IPv6 etc.**
- **Data link management & architecture - improving data link throughput**
- **Persistent and pervasive Intelligence Surveillance Reconnaissance**
- **Joint Combat ID – Indication of Friendly or Foe and Blue Force Tracking**

Marine Corps Warfighting Laboratory (MCWL) Interest Areas

MCWL's mission is concept based experimentation which encompasses wargaming.

- **Seabased Operations**
  - **Over the Horizon, On the Move Voice and Data Communications**
- **Distributed Operations**
  - **Persistent surveillance, actionable intelligence, battlespace shaping, precision targeting**
- **Improvised Explosive Device (IED) Defeat**
  - **Prediction, Detection, Prevention, Neutralization, Mitigation**

Marine Corps Warfighting Laboratory

Col Doug Jerothe, MCWL COS 703.784.5098, douglas.jerothe@usmc.mil

Inquiries

When making an inquiry – please provide the following information for fastest response:

1) Company name, Point of Contact, Tel#, email

2) Technologies available and their TRL; provide a short paragraph with background information on how/where technology has been tested/used

3) Rationale why company thinks technology will meet a Naval Need

4) One page brochure with relevant product description, specification.

Information Resources

- **Department of Navy Information**
  - **Navy Acquisition, Research and Development Information Center (NARDIC)**
  - **http://www.onr.navy.mil/sci_tech/industrial/362/nardic/**
- **Department of Navy Vision**
  - **Sea Power 21**
  - **http://www.chinfo.navy.mil/navpalib/cno/proceedings.html**
- **ONR**
  - **http://www.onr.navy.mil**
- **DoD Technology Transition**
  - **http://www.dtic.mil/techtransit/**
- **DoD/Navy Technology Needs**
  - **http://www.dodtechmatch.com**
  - www.**fedbiz**opps.gov
  - **http://www.acq.osd.mil/sadbu/sbir/**

Thank You

Questions?

Thank you for your interest in doing business

with the Department of Navy!